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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/784,182	Applicant(s) SAWANO, HIDEKI
	Examiner Anthony S. Addy	Art Unit 2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 03, 2007 has been entered. New **claim 20** has been added. **Claims 1-20** are now pending in the present application.

Response to Arguments

2. Applicant's arguments with respect to **claims 1-20** have been considered but are moot in view of the new ground(s) of rejection. Arguments are directed to newly added limitations and the new ground(s) of rejection based on the newly added limitations follow below.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Murphy, U.S. Patent Number 6,094,164 (hereinafter Murphy)** and **Calvert et al., U.S. Publication Number 2002/0102989 A1 (hereinafter Calvert)** and **O'Neil, U.S. Patent**

Number 6,778,818 (hereinafter O'Neil) and further in view of **Gwon et al., U.S. Publication Number 2004/203904 A1 (hereinafter Gwon)**.

Regarding claims 1 and 20, Murphy teaches a measuring apparatus cooperating with a service device that provides position information of a search object (see col. 3, line 62 through col. 4, line 12, col. 6, lines 22-50 and Fig. 1B; shows tracking units 10A-10C [i.e. reads on a measuring apparatus] cooperating with a base station 20 [i.e. reads on a service device] that provides position information of an object 12 [i.e. reads on a search object]), comprising: a unit for transmitting and receiving information (see col. 7, lines 1-14 and Fig. 2); a unit calculating only a distance between the measuring apparatus and the search object (see col. 4, lines 43-59, col. 10, lines 43-45 and Figs. 4A-4C); a unit acquiring present position information of the measuring apparatus (see col. 7, lines 15-21 and Fig. 2); and a unit transmitting the present position information and the distance information to the service device (see col. 4, lines 43 through col. 5, line 9, col. 7, lines 1-14 and Fig. 2), wherein the service device is placed at a predetermined fixed location (see col. 4, lines 60-67, col. 7, lines 59-64 and Fig. 1B; shows a base station 20 placed at a predetermined fixed location from tracking units 10A-10C), and wherein the measuring apparatus is mobile and a plurality of measuring apparatuses located around the search object cooperate with the service device (see col. 10, lines 3-56 and Fig. 3; shows mobile tracking units 10a-10c attached to moving vehicles 42a-42c [i.e. reads on the limitations "measuring apparatus is mobile"]).

Murphy fails to explicitly teach the measuring apparatus accepting from a request apparatus a search request for searching the position of the search object.

In an analogous field of endeavor, Calvert teaches a method and apparatus for accurately locating a communication device in a wireless communication system, wherein a requesting device such as a wireless/wireline telephone device sends a request for the location of a communication device to a wireless system controller (see p. 2 [0023], p. 4 [0034] and Fig. 1 [i.e. wireless/wireline telephone devices 101, 102 & 113 reads on a request apparatus requesting position information from wireless system controller 107 [i.e. reads on a measuring apparatus] of a communication device 101 [i.e. reads on a search object] in the wireless system 100]). According to Calvert, the search request preferably includes the identification (ID) or address of the communication device to be located and the address or ID of the requesting device to which the location is to be sent (see p. 4 [0034]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Murphy with Calvert to include the measuring apparatus accepting from a request apparatus a search request for searching the position of a search object, in order to accurately locate a communication device by including the identification (ID) or address of the communication device to be located in a search request to the system infrastructure as taught by Calvert (see p. 2 [0020] and p. 4 [0034]).

The combination of Murphy and Calvert fails to explicitly teach wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located.

In an analogous field of endeavor, O'Neil teaches a snapshot requests generated by a requesting apparatus such as a PSAP agent to determine the location of a 911 caller includes a particular radius R a position server should use in conducting its search (see col. 7, lines 1-11). O'Neil, further teaches the search range defined by the PSAP uses the 911 caller location as the center point of the search radius and information of all mobile stations within the radius R which are found could later be provided to police or other investigators to serve as potential witnesses to the emergency 911 caller (see col. 7, lines 11-31 and Fig. 8).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of establishing a search radius to determine a location of a target as taught by O'Neil, to the system of Murphy and Calvert, wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located, in order to determine with a high level of accuracy the location of a target communication device such as an emergency 911 caller and additionally locate potential witnesses in terms of other mobile communication devices within an established search radius of the emergency 911 caller as taught by O'Neil (see col. 7, lines 11-31 and Fig. 8).

The combination of Murphy, Calvert and O'Neil fails to explicitly teach wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object.

However, the feature of calculating the position of an object by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object is very well known in the art as taught for example by Gwon.

In an analogous field of endeavor, Gwon teaches a triangulation technique for calculating the location of a wireless receiver based on the characteristics of signals received from fixed base units, wherein the final location of the receiver is obtained by computing the centroid of the smallest-area triangle formed by a three-point subset of six points (see p. 5 [0065-0066], p. 7 [0108-0121] and Fig. 6). According to Gwon, the six points are intersections of three circles obtained by solving systems of equations for circles whose centers are locations of three base units (i.e. the measuring apparatuses), and whose radii are determined by signal strength measurements (see p. 5 [0065-0066], p. 7 [0108] and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of calculating the position of an object by solving an equation of circles as taught by Gwon, to the system of Murphy, Calvert and O'Neil, wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object, in order to determine with a high level of accuracy the location of a wireless receiver such as an emergency 911 caller using a set of best-matching test points and then combining these points to create an enhanced

smallest-polygon calculation to calculate the location of the wireless receiver with a high precision as taught by Gwon (see p. 1 [0004-0008] and p. 5 [0065-0066]).

Regarding claim 2, the combination of Murphy, Calvert, O'Neil and Gwon teaches all the limitations of claim 1. Murphy further teaches a measuring apparatus, further comprising: a unit transmitting radio waves receivable by the search object (see col. 7, lines 1-14, col. 4, lines 25-31 and Fig. 2); and a unit receiving a response to the radio waves from the search object (see col. 7, lines 1-14, col. 4, lines 25-31 and Fig. 2).

Regarding claims 4 and 5, Murphy teaches a service device for providing position information of a search object (see col. 4, line 51 through col. 5, line 18 and Fig. 1B; shows a base station 20 [i.e. reads on a service device] that provides position information of an object 12 [i.e. reads on a search object]), comprising: a unit receiving, from a plurality of measuring apparatus for measuring a position of the search object, present position information of each of the plurality of measuring apparatuses and information about a distance between each of the plurality of measuring apparatuses making the measurement and the search object (see col. 4, lines 43-59, col. 10, lines 22-56 and col. 13, lines 37-57), and calculating the position information of the search object, based on the present position information and the information about the distance to the search object received from the measuring apparatus (see col. 5, lines 2-4, col. 6, lines 42-48 and col. 8, lines 13-16); and a unit transmitting to an apparatus the position information of the search object that has been calculated based on the present position information and the information about the distance to the search object received from

each of the plurality of measuring apparatuses (see col. 4, lines 43-59 and col. 10, lines 3-56), wherein the service device is placed at a predetermined fixed location (see col. 4, lines 60-67, col. 7, lines 59-64 and Fig. 1B; shows a base station 20 placed at a predetermined fixed location from tracking units 10A-10C), wherein each of the plurality of measuring apparatuses is mobile (see col. 10, lines 3-56 and Fig. 3; shows mobile tracking units 10a-10c attached to moving vehicles 42a-42c [i.e. reads on the limitations "wherein each of the plurality of measuring apparatuses is mobile"]) and calculates only a distance between each of the plurality of measuring apparatuses and the search object (see col. 4, lines 43-59 and col. 10, lines 43-45), and the plurality of measuring apparatuses located around the search object cooperate with the service device (see col. 10, lines 46-52).

Murphy fails to explicitly teach a request apparatus requesting the position information of the search object and transmitting to the request apparatus the position information of the search object.

In an analogous field of endeavor, Calvert teaches a method and apparatus for accurately locating a communication device in a wireless communication system, wherein a requesting device such as a wireless/wireline telephone device sends a request for the location of a communication device to a wireless system controller (see p. 2 [0023], p. 4 [0034] and Fig. 1 [i.e. wireless/wireline telephone devices 101, 102 & 113 reads on a request apparatus requesting position information from wireless system controller 107 [i.e. reads on a measuring apparatus] of a communication device 101 [i.e. reads on a search object] in the wireless system 100]). According to Calvert, the search

request preferably includes the identification (ID) or address of the communication device to be located and the address or ID of the requesting device to which the location is to be sent (see p. 4 [0034]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Murphy with Calvert to include a request apparatus requesting the position information of the search object and transmitting to the request apparatus the position information of the search object, in order to accurately locate a communication device by including the identification (ID) or address of the communication device to be located in a search request to the system infrastructure as taught by Calvert (see p. 2 [0020] and p. 4 [0034]).

The combination of Murphy and Calvert fails to explicitly teach wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located.

In an analogous field of endeavor, O'Neil teaches a snapshot requests generated by a requesting apparatus such as a PSAP agent to determine the location of a 911 caller includes a particular radius R a position server should use in conducting its search (see col. 7, lines 1-11). O'Neil, further teaches the search range defined by the PSAP uses the 911 caller location as the center point of the search radius and information of all mobile stations within the radius R which are found could later be provided to police or other investigators to serve as potential witnesses to the emergency 911 caller (see col. 7, lines 11-31 and Fig. 8).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of establishing a search radius to determine a location of a target as taught by O'Neil, to the system of Murphy and Calvert, wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located, in order to determine with a high level of accuracy the location of a target communication device such as an emergency 911 caller and additionally locate potential witnesses in terms of other mobile communication devices within an established search radius of the emergency 911 caller as taught by O'Neil (see col. 7, lines 11-31 and Fig. 8).

The combination of Murphy, Calvert and O'Neil fails to explicitly teach wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object.

However, the feature of calculating the position of an object by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object is very well known in the art as taught for example by Gwon.

In an analogous field of endeavor, Gwon teaches a triangulation technique for calculating the location of a wireless receiver based on the characteristics of signals received from fixed base units, wherein the final location of the receiver is obtained by computing the centroid of the smallest-area triangle formed by a three-point subset of six points (see p. 5 [0065-0066], p. 7 [0108-0121] and Fig. 6). According to Gwon, the

six points are intersections of three circles obtained by solving systems of equations for circles whose centers are locations of three base units (i.e. the measuring apparatuses), and whose radii are determined by signal strength measurements (see p. 5 [0065-0066], p. 7 [0108] and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of calculating the position of an object by solving an equation of circles as taught by Gwon, to the system of Murphy, Calvert and O'Neil, wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object, in order to determine with a high level of accuracy the location of a wireless receiver such as an emergency 911 caller using a set of best-matching test points and then combining these points to create an enhanced smallest-polygon calculation to calculate the location of the wireless receiver with a high precision as taught by Gwon (see p. 1 [0004-0008] and p. 5 [0065-0066]).

Regarding claims 8 and 14, Murphy teaches a method of cooperating with a service device that provides position information of a search object, comprising: transmitting radio waves receivable by the search object (see col. 4, lines 25-31 and Fig. 1B; shows communication links 18A, 18B, 18C between search object 12 and tracking units 10); receiving a response to the radio waves from the search object (see col. 4, lines 25-31 and Fig. 1B; shows communication links 18A, 18B, 18C between search object 12 and tracking units 10); calculating only a distance between each of the plurality of measuring apparatuses and the search object from the response received

(see col. 4, lines 43-59 and col. 10, lines 43-45); acquiring present position information of each of the plurality of measuring apparatuses (see col. 10, lines 22-56 and col. 7, lines 15-21); and transmitting the present position information and the distance of each of the plurality of measuring apparatuses to the service device (see col. 4, line 43 through col. 5, line 9, col. 7, lines 1-14 and col. 10, lines 22-56), wherein the service device is placed at a predetermined fixed location (see col. 4, lines 60-67, col. 7, lines 59-64 and Fig. 1B; shows a base station 20 placed at a predetermined fixed location from tracking units 10A-10C), and wherein each of the plurality of measuring apparatuses is mobile (see col. 10, lines 3-56 and Fig. 3; shows mobile tracking units 10a-10c attached to moving vehicles 42a-42c [i.e. reads on the limitations "wherein each of the plurality of measuring apparatuses is mobile"]), and the plurality of measuring apparatuses located around the search object cooperate with the service device (see col. 10, lines 46-52).

Murphy fails to explicitly teach a request apparatus requesting a position of the search object.

In an analogous field of endeavor, Calvert teaches a method and apparatus for accurately locating a communication device in a wireless communication system, wherein a requesting device such as a wireless/wireline telephone device sends a request for the location of a communication device to a wireless system controller (see p. 2 [0023], p. 4 [0034] and Fig. 1 [i.e. wireless/wireline telephone devices 101, 102 & 113 reads on a request apparatus requesting position information from wireless system controller 107 [i.e. reads on a measuring apparatus] of a communication device 101 [i.e.

reads on a search object] in the wireless system 100]). According to Calvert, the search request preferably includes the identification (ID) or address of the communication device to be located and the address or ID of the requesting device to which the location is to be sent (see p. 4 [0034]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Murphy with Calvert to include a request apparatus requesting a position of the search object, in order to accurately locate a communication device by including the identification (ID) or address of the communication device to be located in a search request to the system infrastructure as taught by Calvert (see p. 2 [0020] and p. 4 [0034]).

The combination of Murphy and Calvert fails to explicitly teach wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located.

In an analogous field of endeavor, O'Neil teaches a snapshot requests generated by a requesting apparatus such as a PSAP agent to determine the location of a 911 caller includes a particular radius R a position server should use in conducting its search (see col. 7, lines 1-11). O'Neil, further teaches the search range defined by the PSAP uses the 911 caller location as the center point of the search radius and information of all mobile stations within the radius R which are found could later be provided to police or other investigators to serve as potential witnesses to the emergency 911 caller (see col. 7, lines 11-31 and Fig. 8).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of establishing a search radius to determine a location of a target as taught by O'Neil, to the method of Murphy and Calvert, wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located, in order to determine with a high level of accuracy the location of a target communication device such as an emergency 911 caller and additionally locate potential witnesses in terms of other mobile communication devices within an established search radius of the emergency 911 caller as taught by O'Neil (see col. 7, lines 11-31 and Fig. 8).

The combination of Murphy, Calvert and O'Neil fails to explicitly teach wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object.

However, the feature of calculating the position of an object by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object is very well known in the art as taught for example by Gwon.

In an analogous field of endeavor, Gwon teaches a triangulation technique for calculating the location of a wireless receiver based on the characteristics of signals received from fixed base units, wherein the final location of the receiver is obtained by computing the centroid of the smallest-area triangle formed by a three-point subset of six points (see p. 5 [0065-0066], p. 7 [0108-0121] and Fig. 6). According to Gwon, the

six points are intersections of three circles obtained by solving systems of equations for circles whose centers are locations of three base units (i.e. the measuring apparatuses), and whose radii are determined by signal strength measurements (see p. 5 [0065-0066], p. 7 [0108] and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of calculating the position of an object by solving an equation of circles as taught by Gwon, to the method of Murphy, Calvert and O'Neil, wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object, in order to determine with a high level of accuracy the location of a wireless receiver such as an emergency 911 caller using a set of best-matching test points and then combining these points to create an enhanced smallest-polygon calculation to calculate the location of the wireless receiver with a high precision as taught by Gwon (see p. 1 [0004-0008] and p. 5 [0065-0066]).

Regarding claims 10 and 16, Murphy teaches a method of providing position information of a search object (see col. 3, line 62 through col. 4, line 12, col. 6, lines 22-50 and Fig. 1B), comprising: receiving, from a plurality of measuring apparatuses that each measures a position of the search object, present position information of each of the plurality of measuring apparatuses and information about a distance between each of the plurality of measuring apparatuses making the measurement and the search object (see col. 4, lines 43-59, col. 7, lines 1-14 and col. 10, lines 22-56); calculating the position information of the search object, based on the present position information and

the information about the distance to the search object received from each of the plurality of measuring apparatuses (see col. 4, lines 43-59, col. 7, lines 1-14 and col. 10, lines 22-56); and transmitting to an apparatus the position information of the search object that has been calculated based on the present position information and the information about the distance to the search object received from each of the plurality of measuring apparatus (see col. 9, lines 4-15 and col. 10, lines 22-56), wherein each of the plurality of measuring apparatuses is mobile (see col. 10, lines 3-56 and Fig. 3; shows mobile tracking units 10a-10c attached to moving vehicles 42a-42c [i.e. reads on the limitations "wherein each of the plurality of measuring apparatuses is mobile"]) and calculates only a distance between each of the plurality of measuring apparatuses and the search object (see col. 4, lines 43-59 and col. 10, lines 43-45), and the plurality of measuring apparatuses located around the search object cooperate with the service device (see col. 10, lines 46-52).

Murphy fails to explicitly teach a request apparatus requesting the position information of the search object and transmitting to the request apparatus the position information of the search object.

In an analogous field of endeavor, Calvert teaches a method and apparatus for accurately locating a communication device in a wireless communication system, wherein a requesting device such as a wireless/wireline telephone device sends a request for the location of a communication device to a wireless system controller (see p. 2 [0023], p. 4 [0034] and Fig. 1 [i.e. wireless/wireline telephone devices 101, 102 & 113 reads on a request apparatus requesting position information from wireless system

controller 107 [i.e. reads on a measuring apparatus] of a communication device 101 [i.e. reads on a search object] in the wireless system 100]). According to Calvert, the search request preferably includes the identification (ID) or address of the communication device to be located and the address or ID of the requesting device to which the location is to be sent (see p. 4 [0034]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Murphy with Calvert to include a request apparatus requesting the position information of the search object and transmitting to the request apparatus the position information of the search object, in order to accurately locate a communication device by including the identification (ID) or address of the communication device to be located in a search request to the system infrastructure as taught by Calvert (see p. 2 [0020] and p. 4 [0034]).

The combination of Murphy and Calvert fails to explicitly teach wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located.

In an analogous field of endeavor, O'Neil teaches a snapshot requests generated by a requesting apparatus such as a PSAP agent to determine the location of a 911 caller includes a particular radius R a position server should use in conducting its search (see col. 7, lines 1-11). O'Neil, further teaches the search range defined by the PSAP uses the 911 caller location as the center point of the search radius and information of all mobile stations within the radius R which are found could later be

provided to police or other investigators to serve as potential witnesses to the emergency 911 caller (see col. 7, lines 11-31 and Fig. 8).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of establishing a search radius to determine a location of a target as taught by O'Neil, to the method of Murphy and Calvert, wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located, in order to determine with a high level of accuracy the location of a target communication device such as an emergency 911 caller and additionally locate potential witnesses in terms of other mobile communication devices within an established search radius of the emergency 911 caller as taught by O'Neil (see col. 7, lines 11-31 and Fig. 8).

The combination of Murphy, Calvert and O'Neil fails to explicitly teach wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object.

However, the feature of calculating the position of an object by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object is very well known in the art as taught for example by Gwon.

In an analogous field of endeavor, Gwon teaches a triangulation technique for calculating the location of a wireless receiver based on the characteristics of signals received from fixed base units, wherein the final location of the receiver is obtained by

computing the centroid of the smallest-area triangle formed by a three-point subset of six points (see p. 5 [0065-0066], p. 7 [0108-0121] and Fig. 6). According to Gwon, the six points are intersections of three circles obtained by solving systems of equations for circles whose centers are locations of three base units (i.e. the measuring apparatuses), and whose radii are determined by signal strength measurements (see p. 5 [0065-0066], p. 7 [0108] and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of calculating the position of an object by solving an equation of circles as taught by Gwon, to the method of Murphy, Calvert and O'Neil, wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object, in order to determine with a high level of accuracy the location of a wireless receiver such as an emergency 911 caller using a set of best-matching test points and then combining these points to create an enhanced smallest-polygon calculation to calculate the location of the wireless receiver with a high precision as taught by Gwon (see p. 1 [0004-0008] and p. 5 [0065-0066]).

Regarding claims 11 and 17, Murphy teaches a method of providing information of a search object through a system including a service device that provides the position information of the search object and a plurality of measuring apparatuses for reporting distances to the search object to the search device (see col. 3, line 62 through col. 4, line 12, col. 6, lines 22-50 and Fig. 1B; shows tracking units 10A-10C [i.e. reads on a plurality of measuring apparatus] cooperating with a base station 20 [i.e. reads on a

service device] that provides position information of an object 12 [i.e. reads on a search object]), comprising: receiving via the service device the position information of the search object calculated based upon the reporting from the measuring apparatuses, wherein the service device is placed at a predetermined fixed location (see col. 4, lines 43 through col. 5, line 9, col. 7, lines 1-14, col. 7, lines 59-64, col. 10, lines 22-56 and Fig. 1B; shows a base station 20 placed at a predetermined fixed location from tracking units 10A-10C), wherein each of the plurality of measuring apparatuses is mobile (see col. 10, lines 3-56 and Fig. 3; shows mobile tracking units 10a-10c attached to moving vehicles 42a-42c [i.e. reads on the limitations "wherein each of the plurality of measuring apparatuses is mobile"]) and calculates only a distance between each of the plurality of measuring apparatuses and the search object (see col. 4, lines 43-59 and col. 10, lines 43-45), and the plurality of measuring apparatuses located around the search object cooperate with the service device (see col. 10, lines 46-52).

Murphy fails to explicitly teach transmitting by a request apparatus, a search request for the position information of the search object to the measuring apparatuses existing in a periphery of the apparatus.

In an analogous field of endeavor, Calvert teaches a method and apparatus for accurately locating a communication device in a wireless communication system, wherein a requesting device such as a wireless/wireline telephone device sends a request for the location of a communication device to a wireless system controller (see p. 2 [0023], p. 4 [0034] and Fig. 1 [i.e. wireless/wireline telephone devices 101, 102 & 113 reads on a request apparatus requesting position information from wireless system

controller 107 [i.e. reads on a measuring apparatus] of a communication device 101 [i.e. reads on a search object] in the wireless system 100]). According to Calvert, the search request preferably includes the identification (ID) or address of the communication device to be located and the address or ID of the requesting device to which the location is to be sent (see p. 4 [0034]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Murphy with Calvert to include, transmitting by a request apparatus, a search request for the position information of the search object to the measuring apparatuses existing in a periphery of the apparatus, in order to accurately locate a communication device by including the identification (ID) or address of the communication device to be located in a search request to the system infrastructure as taught by Calvert (see p. 2 [0020] and p. 4 [0034]).

The combination of Murphy and Calvert fails to explicitly teach wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located.

In an analogous field of endeavor, O'Neil teaches a snapshot requests generated by a requesting apparatus such as a PSAP agent to determine the location of a 911 caller includes a particular radius R a position server should use in conducting its search (see col. 7, lines 1-11). O'Neil, further teaches the search range defined by the PSAP uses the 911 caller location as the center point of the search radius and information of all mobile stations within the radius R which are found could later be

provided to police or other investigators to serve as potential witnesses to the emergency 911 caller (see col. 7, lines 11-31 and Fig. 8).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of establishing a search radius to determine a location of a target as taught by O'Neil, to the method of Murphy and Calvert, wherein a search range, within which the position of the search object is requested, is determined as a search range in which the request apparatus is located, in order to determine with a high level of accuracy the location of a target communication device such as an emergency 911 caller and additionally locate potential witnesses in terms of other mobile communication devices within an established search radius of the emergency 911 caller as taught by O'Neil (see col. 7, lines 11-31 and Fig. 8).

The combination of Murphy, Calvert and O'Neil fails to explicitly teach wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object.

However, the feature of calculating the position of an object by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object is very well known in the art as taught for example by Gwon.

In an analogous field of endeavor, Gwon teaches a triangulation technique for calculating the location of a wireless receiver based on the characteristics of signals received from fixed base units, wherein the final location of the receiver is obtained by

computing the centroid of the smallest-area triangle formed by a three-point subset of six points (see p. 5 [0065-0066], p. 7 [0108-0121] and Fig. 6). According to Gwon, the six points are intersections of three circles obtained by solving systems of equations for circles whose centers are locations of three base units (i.e. the measuring apparatuses), and whose radii are determined by signal strength measurements (see p. 5 [0065-0066], p. 7 [0108] and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of calculating the position of an object by solving an equation of circles as taught by Gwon, to the method of Murphy, Calvert and O'Neil, wherein the position of the search object is calculated by solving an equation of circles, each circle having a radius equal to a distance between one of the plurality of measuring apparatuses and the search object, in order to determine with a high level of accuracy the location of a wireless receiver such as an emergency 911 caller using a set of best-matching test points and then combining these points to create an enhanced smallest-polygon calculation to calculate the location of the wireless receiver with a high precision as taught by Gwon (see p. 1 [0004-0008] and p. 5 [0065-0066]).

Regarding claims 7, 13 and 19, the combination of Murphy, Calvert, O'Neil and Gwon teaches all the limitations of claims 5, 11 and 17. Calvert further teaches receiving setting of a search object range in the periphery of the request apparatus, and controlling electromagnetic waves carrying the search request at a predetermined receipt electric power level in the search object range (see p. 4 [0034 & 0037-0039]).

Regarding claims 3, 6, 9, 12, 15 and 18, the combination of Murphy, Calvert, O'Neil and Gwon teaches all the limitations of claims 1, 5, 8, 11, 13 and 17. Calvert further teaches wherein the search request contains information capable of specifying the request apparatus, and the unit transmitting the present position information and the distance information together with the specifiable information to the service device (see p. 4 [0034 & 0037-0039]).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony S. Addy whose telephone number is 571-272-7795. The examiner can normally be reached on Mon-Thur 8:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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